3. Pending paragraph of the specification that starts at **page 18, line 8**:

Figure 7 is a flow diagram which sets forth the steps performed by an agent during the local operating time interval 608. At step 700, the agent computes a local response to sensor information received from sensors to which it is coupled. At step 702, the local response is assigned to equal a desired response. The desired response is the desired correctional command sought to be issued to the actuator units to which the agent is coupled. At step 704, an agent detects a value of the potential field 606. The values of the potential field can be fixed at the time system variables of the transport assembly are initialized at start up. Alternatively, the values of the global field can be adaptively modified as set forth in U.S. Patent No. 6,027,112.

4. Pending paragraph of the specification that starts at **page 23, line 12**:

While the present invention has been illustrated using a two level controller 230, it will be appreciated by those skilled in the art that the two level controller can be generalized to multiple levels. For example, the agents 600 could be grouped into multi-hierarchical levels of control to define regions of control as described in detail in U.S. Patent No. 6,039,316. Alternatively, multiple controllers 230 could be grouped into multi-hierarchical levels of control. It will also be appreciated that the controller 230 as defined herein can be used to stabilize materials as set forth in U.S. Patent No. 6,119,052 or U.S. Patent No. 6,027,112. In this alternate embodiment, the global controller changes the potential field to encourage agents to compensate for parts of the structure that are under stress.

REMARKS

The Office Action of August 29, 2001 has been carefully considered. Reconsideration of this application, as amended, is respectfully requested. Claims 1-20 are pending in this application. Of these, claims 1 and 15 are independent claims.

1. Amendments To Specification

This Amendment amends the specification to add patent numbers that were not known at the time of filing.

2. Response to Rejection Under 35 USC 102

The Office Action, in section 2, on page 2, rejects claims 1, 7, 8, and 15 under 35 USC 102(b) as being anticipated by a publication by Satoshi Konishi and Hiroyuki Fujita, entitled "A Conveyance System Using Air Flow Based on the Concept of Distributed Micro Motion Systems", published in the Journal of Microelectromechanical Systems, Volume 3., No. 2, pages 54-58, June 1994 (hereinafter referred to as "Konishi").

In maintaining the rejection, the Office Action cites Figures 1, 2 and the abstract of Konishi. In Figures 1, 2, and the abstract, Konishi discloses a microactuator array for a planar conveyance system. In addition, on page 54, column 1, Konishi "proposes the concept of distributed micro motions systems (DMMS)" as illustrated in Figure 1. This cited column of Konishi further discloses that "the ultimate form of DMMS is expected to consist of many smart modules which have microactuators, microsensors, and controllers."

Applicants respectfully traverse the rejection of independent claims 1 and 15 and submit that Konishi neither suggests nor discloses Applicants claimed invention set forth in independent claims 1 and 15, which is described in Section B of Applicants specification entitled "Distributed Control With Global Constraints". Specifically, Konishi does not disclose or suggest the sensor units, local computational agents, and global controller as claimed by Applicants in independent claim 1, or the method for operating computational agents of a transport assembly having also sensors, actuators, and a global controller for moving an object on the transport assembly as claimed by Applicants in independent claim 15.

With specific reference to independent claim 1, Konishi does not disclose or suggest a global controller that is coupled to local computational agents from which it receives "aggregate operating characteristics" and to which it delivers "global

constraints". In addition, claims 1 sets forth that the local computational agents use the global constraints and "sensor information from a spatially localized grouping of sensor units" to determine adjustments to actuator units to move an object along a transport assembly.

With specific reference to claim to independent claim 15, Konishi does not disclose or suggest a method for operating computational agents of a transport assembly having also sensors, actuators, and a global controller for moving an object on the transport assembly. More specifically, the method includes computing a "local actuator response", a "global actuator response", and a "desired actuator response" that minimizes differences between the computed local actuator response and the computed global actuator response, where the desired actuator response is applied to a spatially localized grouping of actuator units.

Accordingly, Applicants respectfully submit that independent claims 1 and 15 are patentably distinguishable over Konishi. Insofar as claims 7 and 8 are concerned, these claims depend from presumably allowable independent claim 1 and are also believed to be in allowable condition.

3. Response to Rejection Under 35 USC 103

The Office Action, in section 4, on page 4, rejects claims 2-6, 9-14, and 16-20 under 35 USC 103(a) as being unpatentable over Fujita in view of Keeler et al., U.S. Patent No. 5,559,690. There is no need to specifically address the merits of claims 2-6, 9-14, and 16-20 because they depend from either claim 1 or claim 15, both of which are clearly patentable for the reasons set forth above. Accordingly, this rejection under 35 USC 103(a) is believed to be overcome.

4. Response to Double Patenting Rejection

The Office Action, in section 6, on pages 7-8, rejects claims 1-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over: (a) claims 1-20 of U.S. Patent No. 6,119,052; (b) claims 1-20 of U.S. Patent No. 6,039,316; (c) claims 1-20 of U.S. Patent No. 6,027,112; and (d) claims 1-6 of U.S. Patent No. 5,634,636. The reason for the rejection for each is identical, as follows:

"Although the conflicting claims are not identical, they are not patentably distinct from each other because they both describe a distributed control system for controlling microactuator arrays to transport sheets."

Applicants respectfully traverse the rejection of claims 1-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of (d) above (U.S. Patent No. 5,634,636). Applicants submit that the claims 1-20 of the instant patent application that include elements of a transport assembly control system, and operating method therefor, are patentably distinct from claims 1-6 of U.S. Patent No. 5,634,636 for the reasons stated above with respect to their patentability over Fujita.

Referring now to the rejection of claims 1-20 based on (a)-(c) above (U.S. Patent Nos. 6,119,052; 6,039,316; 6,027,112), Applicants will submit a terminal disclaimer to overcome this rejection should the rejection to claims 1-20 based on (d) above (U.S. Patent No. 5,634,636) be withdrawn in view of Applicants' remarks. In accordance with M.P.E.P. § 804.02, the filing of such a terminal disclaimer shall not be deemed an admission of the propriety of the double patenting rejection. Quad Environmental Technologies Corp. v. Union Sanitary District, 946 F.2d 870, 20 U.S.P.Q. 2d 1392 (Fed. Cir. 1991).

5. Conclusion

In view of the foregoing remarks, reconsideration of this application and allowance thereof are earnestly solicited. In the event the Examiner considers a personal contact advantageous to the disposition of this case, the Examiner is hereby requested to call Attorney for Applicant(s), Thomas Zell.

Respectfully submitted,

Thomas Zell

Thomas Zell
Attorney for Applicant(s)
Registration No. 37,481
Telephone: 650-812-4282

Grenoble, France
Date: November 29, 2001

APPENDIX

Marked Up Amended Paragraphs Of Specification:

This section of the Appendix sets forth a marked up version of the prior pending paragraphs(s) in the specification other than the claims with additions shown with underlining (e.g., new text) and deletions shown with a strikethrough (e.g., ~~delete text~~) under 37 C.F.R. 1.121(b)(1)(iii).

1. Pending paragraph of the specification that starts at **page 1, line 4**:

Cross-reference is made to the following U.S. Patents ~~Applications~~, each of which is assigned to the same assignee as the present invention and hereby incorporated by reference: U.S. Patent No. 6,039,316~~Serial No. 08/AAA,AAA~~, entitled "Multi-Hierarchical Control System For Controlling Object Motion With Smart Matter" ~~(Attorney Docket No. D/98090)~~; U.S. Patent No. 6,119,052~~Serial No. 08/BBB,BBB,~~ entitled "Market-Based Control System For Controlling Object Motion With Smart Matter" ~~(Attorney Docket No. D/98091)~~; and U.S. Patent No. 6,027,112~~Serial No. 08/CCC,CCC,~~ entitled "Adaptive Multiagent Control System For Controlling Object Motion With Smart Matter" ~~(Attorney Docket No. D/98092)~~.

2. Pending paragraph of the specification that starts at **page 17, line 16**:

The potential field 606 can be specified using either mechanical or electrical forces. For example in the transport assembly, each agent could detect values of global constraint preferences from a wire carrying a range of voltage potentials. Alternatively, each agent could detect regional air pressure settings of the transport assembly. In this alternate embodiment, values of the global constraints are reflected regionally by the pressure difference between low-pressure plenum 214 and high-pressure plenum 216. In another embodiment, global constraints could be conveyed using funding policies of computational markets. More details of computational markets ~~is~~ are disclosed in U.S. Patent ~~Application Serial~~ No. 6,119,052~~08/BBB,BBB (Attorney Docket No. D/98091)~~. In yet another embodiment probabilistic and randomized algorithms are used to define

local agent behavior, and in which global constraints are conveyed using probability values that are delivered to the collection of agents. In a further embodiment, the global controller delivers the values of the potential field digitally using a broadcast network or a shared memory storing a lookup table.

3. Pending paragraph of the specification that starts at **page 18, line 8**:

Figure 7 is a flow diagram which sets forth the steps performed by an agent during the local operating time interval 608. At step 700, the agent computes a local response to sensor information received from sensors to which it is coupled. At step 702, the local response is assigned to equal a desired response. The desired response is the desired correctional command sought to be issued to the actuator units to which the agent is coupled. At step 704, an agent detects a value of the potential field 606. The values of the potential field can be fixed at the time system variables of the transport assembly are initialized at start up. Alternatively, the values of the global field can be adaptively modified as set forth in U.S. Patent ~~Application Serial~~ No. 6,027,112~~08/CCC,CCC (Attorney Docket No. D/98092)~~.

4. Pending paragraph of the specification that starts at **page 23, line 12**:

While the present invention has been illustrated using a two level controller 230, it will be appreciated by those skilled in the art that the two level controller can be generalized to multiple levels. For example, the agents 600 could be grouped into multi-hierarchical levels of control to define regions of control as described in detail in U.S. Patent ~~Application Serial~~ No. 6,039,316~~08/AAA,AAA (Attorney Docket No. D/98090)~~. Alternatively, multiple controllers 230 could be grouped into multi-hierarchical levels of control. It will also be appreciated that the controller 230 as defined herein can be used to stabilize materials as set forth in U.S. Patent ~~Application Serial~~ No. 6,119,052~~08/BBB,BBB (Attorney Docket No. D/98091)~~ or U.S. Patent ~~Application Serial~~ No. 6,027,112~~08/CCC,CCC (Attorney Docket No. D/98092)~~. In this alternate embodiment, the global controller changes the potential field to encourage agents to compensate for parts of the structure that are under stress.